

Maine Medical Center  
Cumberland County  
Portland, Maine  
A-431-71-H-A (SM)

**Departmental  
Findings of Fact and Order  
Air Emission License  
Amendment #1**

After review of the air emission license minor modification application, staff investigation reports, and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A., Section 344 and Section 590, the Department finds the following facts:

**I. REGISTRATION**

**A. Introduction**

Maine Medical Center (MMC) of Portland, Maine was issued Air Emission License A-431-71-G-M/R on August 31, 2001, permitting the operation of emission sources associated with their health care facility.

MMC has requested a minor modification to construct and operate a new Central Utilities Plant (CUP). The CUP will contain three new boilers, each rated at 46.0 MMBtu/hr firing natural gas and #2 fuel oil. The CUP will also contain a new 2-MW diesel-fired standby electric generator. Once the CUP has been commissioned, the existing boiler plant will be decommissioned and two existing diesel-fired electric generators located in the L.L. Bean Wing will be shut down.

**B. Emission Equipment**

MMC is authorized to operate the following equipment:

**Electrical Generation Equipment**

<b>Equipment</b>	<b>Power Output (kW)</b>	<b>Firing Rate (gal/hr)</b>	<b><u>Stack #</u></b>
Boiler Room Generator	300	21.2	3
<i>LL Bean Wing Generator #1</i>	460	32.8	4
<i>LL Bean Wing Generator #2</i>	460	32.8	4
Fire Pump Generator	135	9.5	5
NDF # 1	450	32.1	6
NDF # 2	450	32.1	6
Computer Room Generator	250	17.5	7
Generator #7	1,250	84.0	8
<b>CUP Generator</b>	2,000	147.5	2

**Bold** depicts new equipment.

*Italics* depicts equipment to be decommissioned after CUP becomes operational.

**Fuel Burning Equipment**

<b><u>Equipment</u></b>	<b><u>Maximum Capacity (MMBtu/hr)</u></b>	<b><u>Maximum Firing Rate*</u></b>	<b><u>Fuel Type</u></b>	<b><u>Stack #</u></b>
<i>Boiler # 1</i>	43.8	313.0 gph	#2 Fuel Oil, 0.46%	2
		43,800 scfh	Natural Gas	
<i>Boiler # 2</i>	25.0	179.0 gph	#2 Fuel Oil, 0.46%	2
		25,000 scfh	Natural Gas	
<i>Boiler # 3</i>	37.5	268.0 gph	#2 Fuel Oil, 0.46%	2
		37,500 scfh	Natural Gas	
<i>Boiler # 4</i>	25.1	180.0 gph	#2 Fuel Oil, 0.46%	2
		25,100 scfh	Natural Gas	
<b>CUP Boiler #1</b>	46.0	329.0 gph	#2 Fuel Oil, 0.35% sulfur	1
		46,000 scfh	Natural Gas	
<b>CUP Boiler #2</b>	46.0	329.0 gph	#2 Fuel Oil, 0.35% sulfur	1
		46,000 scfh	Natural Gas	
<b>CUP Boiler #3</b>	46.0	329.0 gph	#2 Fuel Oil, 0.35% sulfur	1
		46,000 scfh	Natural Gas	

\*Firing rate based on 140,000 Btu/gallon of #2 fuel oil and 1,000 Btu/scf of natural gas.

**Bold** depicts new equipment.

*Italics* depicts equipment to be decommissioned after CUP becomes operational.

C. Application Classification

The modification of a minor source is considered a major modification based on whether or not expected emission increases exceed the “Significant Emission Levels” as defined in the Department’s regulations. The emission increases are determined by subtracting the current licensed emissions preceding the modification from the maximum future licensed allowed emissions, as follows:

**Interim TPY Changes**

<b><u>Pollutant</u></b>	<b><u>Current License (TPY)</u></b>	<b><u>Interim Period (TPY)</u></b>	<b><u>Interim Net Change (TPY)</u></b>	<b><u>Sig. Level</u></b>
PM	29.6	30.1	0.5	100
PM <sub>10</sub>	29.6	30.1	0.5	100
SO <sub>2</sub>	75.0	75.3	0.3	100
NO <sub>x</sub>	86.2	96.7	10.5	100
CO	61.2	62.3	1.1	100
VOC	2.1	2.6	0.3	50

**Future TPY Changes**

<b><u>Pollutant</u></b>	<b><u>Interim Period (TPY)</u></b>	<b><u>Future License (TPY)</u></b>	<b><u>Net Change (TPY)</u></b>	<b><u>Sig. Level</u></b>
PM	30.1	6.8	-23.3	100
PM <sub>10</sub>	30.1	6.8	-23.3	100
SO <sub>2</sub>	75.3	90.6	15.3	100
NO <sub>x</sub>	96.7	81.0	-15.7	100
CO	62.3	22.7	-39.6	100
VOC	2.6	8.4	5.8	50

Both the interim and final modifications are determined to be minor modifications and have been processed as such. With the fuel limit on the boilers and the operating hours restriction on the generator(s), the facility is licensed below the major source thresholds and is considered a synthetic minor (SM).

## **II. BEST PRACTICAL TREATMENT**

In order to receive a license the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in Chapter 100 of the Department regulations. Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in Chapter 100 of the Air Regulations. BACT is a top-down approach to selecting air emission controls considering economic, environmental and energy impacts.

### **A. Introduction**

MMC plans to construct and operate a new Central Utilities Plant (CUP). The CUP will contain three new boilers, each rated at 46.0 MMBtu/hr firing natural gas and #2 fuel oil. The CUP will also contain a new 2-MW diesel-fired standby electric generator, limited to 500 hours/year of operation.

Once the new CUP has been commissioned, Boilers 1, 2, 3 & 4 will be decommissioned and LL Bean Wing Generator #1 and LL Bean Wing Generator #2 diesel-fired electric generators located in the LL Bean Wing will be shut down. During the installation and shakedown period when all seven boilers and all nine generators are licensed, MMC will have an interim fuel use limit which will result in an interim Total Annual Emissions ton per year table (used for fee purposes).

### **B. CUP Boiler 1, 2 & 3**

Specific boilers have not been selected for this project, but CUP Boiler 1, 2 & 3 design is based upon Cleaver Brooks Model CBL-LN packaged firetube boilers

equipped with Industrial Combustion Model LN1LG burners. Each boiler will have a design capacity of 46.0 MMBtu/hr and have the capability of firing natural gas and 0.4% sulfur #2 fuel oil. These boilers will be subject to New Source Performance Standards (NSPS) Subpart Dc, which is applicable to boilers with a heat input of 10 MMBtu/hr or greater and manufactured after June 9, 1989.

BACT for CUP Boiler 1, 2 & 3 is the following:

1. Use of natural gas and 0.35% sulfur #2 fuel oil
2. PM, PM<sub>10</sub>, NO<sub>x</sub>, CO and VOC natural gas and #2 fuel oil emission limits are based on manufacturer emission performance data.
3. SO<sub>2</sub> #2 fuel oil emission limits are based on firing 0.35% sulfur fuel.
4. SO<sub>2</sub> natural gas emission limits are based on AP-42 emission factors dated 7/98.
5. When firing #2 fuel oil, visible emissions from the common stack serving CUP Boiler 1, 2 & 3 (Stack 1) shall not exceed 20% opacity recorded as six (6) minute block averages, except for no more than three (3) six-minute block averages in a 3-hour period. (Chapter 115, BACT)
6. When firing #2 fuel oil, visible emissions from each boiler shall not exceed 20% opacity recorded as six-minute block averages, except for one six-minute period per hour of no more than 27% opacity. (NSPS)
7. When firing natural gas, visible emissions from the common stack serving CUP Boiler 1, 2 & 3 (Stack 1) shall not exceed 10% opacity recorded as six (6) minute block averages, except for no more than three (3) six-minute block averages in a 3-hour period. (Chapter 115, BACT)
8. When firing natural gas, visible emissions from each boiler shall not exceed 10% opacity recorded as six (6) minute block averages, except for no more than one six-minute block average in a 3-hour period. (Chapter 101)

C. CUP Generator

The CUP Generator will have an electrical output of 2.0 MW, but the final model to be installed has not yet been chosen. The two generators being considered are a Cummins Model QSK60-G6 and a Caterpillar Model 3516BDITA.

BACT for the CUP Generator is the following:

1. Total annual hours of operation is limited to 500 hours/year.
2. Chapter 106 regulates fuel sulfur content, however the use of 0.05% sulfur by weight fuel is more stringent and shall be used.
3. SO<sub>2</sub> emission data was based on fuel sulfur mass balance.
4. NO<sub>x</sub>, PM, PM<sub>10</sub>, CO and VOC emission limits are based upon manufacturer data.

5. Opacity from the CUP Generator shall not exceed 20% on a six (6) minute block average basis, except for two (2) six (6) minute block averages in a 3-hour period.

**D. Facility Emissions**

Facility emissions at MMC up to the point of Boiler 1, 2, 3, 4 and LL Bean Wing Generator #1 and #2 decommissioning are based on:

- 2,000,000 gallons/year of #2 fuel oil with a sulfur content not to exceed 0.35% by weight, or 290,000,000 scf of natural gas, or 290,000 MMBtu/year in any combination of the two.
- Each emergency generator operating no more than 500 hours/year

**Interim Annual Emissions for the Facility**  
(used to calculate the annual license fee)

	PM Tons	PM <sub>10</sub> Tons	SO <sub>2</sub> Tons	NO <sub>x</sub> Tons	CO Tons	VOC Tons
Oil in Boilers	28.43	28.43	74.54	50.52	53.52	0.77
Boiler Room Generator	0.15	0.15	0.04	3.20	0.70	0.26
LL Bean Wing Generator #1	0.14	0.14	0.06	3.93	0.93	0.11
LL Bean Wing Generator #2	0.14	0.14	0.06	3.93	0.93	0.11
Fire Pump Generator	0.07	0.07	0.02	1.43	0.31	0.11
NDF # 1	0.22	0.22	0.06	3.85	0.90	0.11
NDF # 2	0.22	0.22	0.06	3.85	0.90	0.11
Computer Room Generator	0.07	0.07	0.03	2.64	0.57	0.21
Generator #7	0.35	0.35	0.15	12.85	2.45	0.30
CUP Generator	0.29	0.29	0.27	10.46	1.13	0.53
<b>Total Tons Per Year</b>	<b>30.1</b>	<b>30.1</b>	<b>75.3</b>	<b>96.7</b>	<b>62.3</b>	<b>2.6</b>

Facility emissions at MMC after Boiler 1, 2, 3, 4 and LL Bean Wing Generator #1 and #2 decommissioning are based on:

- 3,214,286 gallons/year of #2 fuel oil with a sulfur content not to exceed 0.35% by weight, or 450,000,000 scf of natural gas, or 450,000 MMBtu/year in any combination of the two.
- Each emergency generator operating no more than 500 hours/year, firing 0.05% sulfur diesel fuel.

**New Annual Emissions for the Facility**  
(used to calculate the annual license fee)

	PM Tons	PM <sub>10</sub> Tons	SO <sub>2</sub> Tons	NO <sub>x</sub> Tons	CO Tons	VOC Tons
Oil in Boilers	5.38	5.38	79.31	42.75	15.75	6.75
Boiler Room Generator	0.15	0.15	0.04	3.20	0.70	0.26
Fire Pump Generator	0.07	0.07	0.02	1.43	0.31	0.11
NDF # 1	0.22	0.22	0.06	3.85	0.90	0.11
NDF # 2	0.22	0.22	0.06	3.85	0.90	0.11
Computer Room Generator	0.07	0.07	0.03	2.64	0.57	0.21
Generator #7	0.35	0.35	0.15	12.85	2.45	0.30
CUP Generator	0.29	0.29	0.27	10.46	1.13	0.53
<b>Total Tons Per Year</b>	<b>6.8</b>	<b>6.8</b>	<b>79.9</b>	<b>81.0</b>	<b>22.7</b>	<b>8.4</b>

**III. AMBIENT AIR QUALITY ANALYSIS**

A. Overview

A refined modeling analysis was performed to demonstrate that emissions from MMC, in conjunction with other area sources, will not cause or contribute to violations of Maine Ambient Air Quality Standards (MAAQS) for SO<sub>2</sub>, PM<sub>10</sub>, NO<sub>2</sub> or CO.

Although it has been determined that MMC's actual emission levels have decreased from the baseline year, given the significant differences in proposed stack location, stack height and flow characteristics, a Class II SO<sub>2</sub>, PM<sub>10</sub> and NO<sub>x</sub> increment analysis was required.

Since the current licensing action for MMC represents a minor modification to a minor source and the nearest Class I area is approximately 98 kilometers away, MEDEP has determined that an assessment of Class I Air Quality Related Values (AQRVs) is not required.

B. Model Inputs

The ISC-PRIME model was used in refined simple terrain mode to address standards in all areas. In addition, the complex terrain mode (VALLEY) of the SCREEN3 model was used to evaluate impacts in intermediate and complex terrain, i.e., areas where terrain elevations exceed the proposed stack-top elevations.

All modeling was performed in accordance with all applicable requirements of the Maine Department of Environmental Protection, Bureau of Air Quality (MEDEP-BAQ) and the United States Environmental Protection Agency (USEPA).

A valid five year hourly meteorological off-site database was used in the ISC-PRIME refined modeling analysis. The wind data was collected at a height of 100 meters at the S.D. Warren meteorological monitoring site during the 5-year period 1989-1993. Missing data were interpolated or coded as missing. Portland NWS surface temperature data was used. Hourly cloud cover, ceiling height and surface wind speed, also from Portland NWS, were used to calculate stability while hourly mixing heights were derived from surface and upper air data.

Point-source parameters, used in the modeling for MMC and other nearby sources, are listed in Tables III-1. The ISC-PRIME modeling accounted for the potential of building wake effects on emissions from all modeled stacks that are below their respective formula GEP stack heights.

**TABLE III-1 : Point Source Stack Parameters**

Facility/Stack	Stack Base Elevation (m)	Stack Height (m)	GEP Stack Height (m)	Stack Diameter(m)	UTM Easting NAD27 (km)	UTM Northing NAD27 (km)
<b>CURRENT/PROPOSED</b>						
<b>Maine Medical Center</b>						
Main CUP Stack	21.94	52.70	135.00	1.14	396.978	4833.880
Generator Stack	20.42	21.80	140.21	1.14	396.962	4833.907
<b>Megquier Hill Farms</b>						
Main Stack	21.34	26.70	26.68	0.97	394.860	4839.680
Cyclone	21.34	19.66	26.68	0.61	394.863	4839.680
<b>Fairchild Semiconductor</b>						
Stack 1 (Boilers #1 - #4)	18.59	33.53	39.17	0.46	393.000	4832.560
<b>National Semiconductor</b>						
Stack 1 (Boilers #1 - #3)	18.59	39.62	63.25	1.00	393.175	4832.510
Stack 2 (Boiler #4 & #5)	18.59	39.62	63.25	1.00	393.178	4832.504
<b>Florida Power &amp; Light</b>						
Stack 1 (Boilers #1, #2 & #5)	7.90	97.54	128.57	3.02	406.900	4844.640
Stack 2 (Boiler #3)	7.90	97.54	128.57	3.09	406.900	4844.640
Stack 3 (Boiler #4)	7.90	129.54	143.76	7.50	406.890	4844.670
<b>B&amp;M Baked Beans</b>						
Stack 1 (Boiler #1)	5.60	45.72	44.20	1.83	398.800	4836.660
Stack 2 (Boilers #3 & #4)	5.60	30.48	40.38	1.42	398.845	4836.670
<b>SAPPI</b>						
Stack 1 (Boiler #21)	13.11	109.70	109.70	3.20	390.860	4837.640
Stack 2 (Boilers #17, #18 & #20)	13.11	107.60	109.70	5.50	390.880	4837.640

<b>1987 BASELINE</b>						
<b>Maine Medical Center</b>						
Stack 1 (Boiler #1)	43.58	24.38	93.92	1.52	397.020	4833.880
Stack 2 (Boilers #2 & #3)	43.58	38.10	93.92	1.37	397.040	4833.900
<b>Megquier Hill Farms</b>						
Megquier Hill Farms did not exist during this baseline year, no credit to be taken						
<b>Fairchild Semiconductor</b>						
MMC conservatively assumed no credit for Fairchild Semiconductor sources existing in the baseline year						
<b>National Semiconductor</b>						
National Semiconductor did not exist during this baseline year, no credit to be taken						
<b>Florida Power &amp; Light</b>						
MMC conservatively assumed no credit for Florida Power & Light sources existing in the baseline year						
<b>B&amp;M Baked Beans</b>						
MMC conservatively assumed no credit for B&M Baked Beans sources existing in the baseline year						
<b>SAPPI</b>						
MMC conservatively assumed no credit for SAPPI sources existing in the baseline year						
<b>1977 BASELINE</b>						
<b>Maine Medical Center</b>						
Stack 1 (Boiler #1)	43.58	24.38	93.92	1.52	397.020	4833.880
Stack 2 (Boilers #2 & #3)	43.58	38.10	93.92	1.37	397.040	4833.900
<b>Fairchild Semiconductor</b>						
Stack 1 (Boilers #1 - #3)	17.70	12.10	39.17	1.02	393.000	4832.560
<b>Megquier Hill Farms</b>						
Megquier Hill Farms did not exist during this baseline year, no credit to be taken						
<b>National Semiconductor</b>						
National Semiconductor did not exist during this baseline year, no credit to be taken						
<b>Florida Power &amp; Light</b>						
MMC conservatively assumed no credit for Florida Power & Light sources existing in the baseline year						
<b>B&amp;M Baked Beans</b>						
MMC conservatively assumed no credit for B&M Baked Beans sources existing in the baseline year						
<b>SAPPI</b>						
MMC conservatively assumed no credit for SAPPI sources existing in the baseline year						

Emission parameters for MMC and other nearby sources for MAAQS and increment modeling are listed in Table III-2. The emission parameters for MMC are based on the maximum license allowed (worst-case) operating configuration, which accounts for the firing of #2 fuel oil. For the purposes of determining PM<sub>10</sub> and NO<sub>2</sub> impacts, all PM and NO<sub>x</sub> emissions were conservatively assumed to convert to PM<sub>10</sub> and NO<sub>2</sub>, respectively.



TABLE III-2 : Stack Emission Parameters

Facility/Stack	Averaging Periods	SO <sub>2</sub> (g/s)	PM <sub>10</sub> (g/s)	NO <sub>2</sub> (g/s)	CO (g/s)	Stack Temp (K)	Stack Velocity (m/s)
<b>MAXIMUM LICENSE ALLOWED</b>							
<b>Maine Medical Center</b>							
Main CUP Stack	All	4.64	0.28	2.20	0.80	487.50	12.77
Generator Stack	All	0.13	0.15	5.28	0.57	452.00	17.14
<b>Megquier Hill Farms</b>							
Main Stack	All	0.03	2.29	0.64		700.00	5.31
Cyclone	All	0.00	0.14	0.00		300.00	20.32
<b>Fairchild Semiconductor</b>							
Stack 1 (Boilers #1 - #4)	All	5.15	0.99	2.97		438.70	68.40
<b>National Semiconductor</b>							
Stack 1 (Boilers #1 - #3)	All	5.58	0.78	2.05		394.30	14.55
Stack 2 (Boiler #4 & #5)	All	3.72	0.52	1.37		394.30	14.55
<b>Florida Power &amp; Light</b>							
Stack 1 (Boilers #1, #2 & #5)	All	362.51	33.55	74.62		484.00	36.55
Stack 2 (Boiler #3)	All	323.87	29.98	44.98		445.00	28.08
Stack 3 (Boiler #4)	All	634.03	79.26	237.76		489.00	22.68
<b>B&amp;M Baked Beans</b>							
Stack 1 (Boiler #1)	All	2.60	0.98	2.46		450.00	2.12
Stack 2 (Boilers #3 & #4)	All	3.93	0.89	2.22		450.00	5.28
<b>SAPPI</b>							
Stack 1 (Boiler #21)	All	126.60	10.60	50.20		485.00	28.50
Stack 2 (Boilers #17, #18 & #20)	All	52.57	5.02	7.50		450.00	4.69
<b>BASELINE – 1987</b>							
<b>Maine Medical Center</b>							
Stack #1 (Boiler #1)	Annual			0.58		450.00	0.99
Stack #2 (Boilers #2 & #3)	Annual			0.49		450.00	0.68
<b>BASELINE – 1977</b>							
<b>Maine Medical Center</b>							
Stack #1 (Boiler #1)	Short-Term	4.01	0.49			450.00	1.90
	Annual	2.64	0.33			450.00	1.33
Stack #2 (Boilers #2 & #3)	Short-Term	0.73	0.09			450.00	0.28
	Annual	0.68	0.08			450.00	0.26
<i>Fairchild Semiconductor</i>							
Stack 1 (Boilers #1 - #3)	Short-Term	6.50				450.00	4.00
	Annual	5.40				450.00	3.30

**Key:**

Shaded areas = not modeled

### C. Single Source Modeling Impacts

SCREEN3 screening modeling was performed for four MMC operating scenarios that represented maximum, typical and minimum operations. ISC-PRIME refined modeling, using 5 years of meteorological data, and VALLEY screening modeling was then performed for the “worst-case” operating scenario, as determined by the screening modeling.

The model results for MMC alone, in both simple and complex terrain, are shown in Tables III-3 and III-4, respectively. Annual NO<sub>2</sub> impacts from the emergency generator, which were based on short-term emission rates, were adjusted to account for the 500 hours/year license limitation. Maximum predicted impacts that exceed their respective significance level are indicated in boldface type. No further modeling was required for pollutant/terrain combinations that did not exceed their respective significance levels.

**TABLE III-3: Maximum ISC-PRIME Simple Terrain Impacts from MMC Alone**

Pollutant	Averaging Period	Max Impact (µg/m <sup>3</sup> )	Receptor UTM E (km)	Receptor UTM N (km)	Receptor Elevation (m)	Class II Significance Level (µg/m <sup>3</sup> )
SO <sub>2</sub>	3-hour	<b>157.41</b>	397.245	4833.745	44.81	<b>25</b>
	24-hour	<b>95.40</b>	397.045	4833.765	46.94	<b>5</b>
	Annual	<b>16.02</b>	397.065	4833.765	46.94	<b>1</b>
PM <sub>10</sub>	24-hour	<b>10.50</b>	397.045	4833.765	46.94	<b>5</b>
	Annual	<b>2.15</b>	397.065	4833.785	46.33	<b>1</b>
NO <sub>2</sub>	Annual	<b>9.89</b>	397.065	4833.765	46.94	<b>1</b>
CO	1-hour	299.51*	--	--	--	<b>2000</b>
	8-hour	209.66*	--	--	--	<b>500</b>

\* = SCREEN3 simple terrain model result

**TABLE III-4 : Maximum SCREEN3-VALLEY Complex Terrain Impacts from MMC Alone**

Pollutant	Averaging Period	Max Impact (µg/m <sup>3</sup> )	Class II Significance Level (µg/m <sup>3</sup> )
SO <sub>2</sub>	3-hour	7.37	<b>25</b>
	24-hour	2.05	<b>5</b>
	Annual	0.60	<b>1</b>
PM <sub>10</sub>	24-hour	0.29	<b>5</b>
	Annual	0.04	<b>1</b>
NO <sub>2</sub>	Annual	0.41	<b>1</b>
CO	1-hour	4.02	<b>2000</b>
	8-hour	2.80	<b>500</b>

D. Combined Source Modeling Impacts

Because modeled impacts from MMC alone were greater than the significance levels for all simple terrain SO<sub>2</sub>, PM<sub>10</sub> and NO<sub>2</sub> averaging periods, other sources not explicitly included in the modeling analysis must be accounted for by using representative background concentrations for the area.

Background concentrations, listed in Table III-5, are derived from representative Southern Maine urban background data.

**TABLE III-5 : Background Concentrations**

Pollutant	Averaging Period	Background Concentration (µg/m <sup>3</sup> )	Date
SO <sub>2</sub>	3-hour	73	2001-02 <sup>1</sup>
	24-hour	47	
	Annual	8	
PM <sub>10</sub>	24-hour	66	2001-02 <sup>1</sup>
	Annual	24	
NO <sub>2</sub>	Annual	25	2002 <sup>1</sup>

**Notes:**

<sup>1</sup> Portland EMPACT Site

MEDEP-BAQ identified other sources whose impacts would potentially be significant in MMC's significant impact area. Other sources explicitly included in the combined source modeling analysis were; Megquier Hill Farms, Fairchild Semiconductor, National Semiconductor, Florida Power & Light, B&M Baked Beans and SAPPI.

Table III-6 summarizes maximum combined source simple terrain SO<sub>2</sub>, PM<sub>10</sub> and NO<sub>2</sub> impacts. The maximum predicted impacts are added to the conservative background concentrations to demonstrate compliance with MAAQS. All combined source impacts for all pollutant/averaging periods were below their respective MAAQS. Because the predicted impacts using this method meet MAAQS, no further MAAQS modeling for MMC needed to be performed.

**TABLE III-6 : Maximum ISC-PRIME Simple Terrain Combined Sources Impacts**

Pollutant	Averaging Period	Max Impact ( $\mu\text{g}/\text{m}^3$ )	Receptor UTM E (km)	Receptor UTM N (km)	Receptor Elevation (m)	Back-Ground ( $\mu\text{g}/\text{m}^3$ )	Max Total Impact ( $\mu\text{g}/\text{m}^3$ )	MAAQS ( $\mu\text{g}/\text{m}^3$ )
SO <sub>2</sub>	3-hour	<b>417.51</b>	394.000	4846.000	152.40	<b>73</b>	<b>490.51</b>	<b>1150</b>
	24-hour	<b>101.10</b>	393.500	4832.500	18.29	<b>47</b>	<b>148.10</b>	<b>230</b>
	Annual	<b>20.34</b>	397.065	4833.765	46.94	<b>8</b>	<b>28.34</b>	<b>57</b>
PM <sub>10</sub>	24-hour	<b>27.26</b>	395.300	4839.700	36.58	<b>66</b>	<b>93.26</b>	<b>150</b>
	Annual	<b>5.07</b>	394.913	4839.635	18.29	<b>24</b>	<b>29.07</b>	<b>40</b>
NO <sub>2</sub>	Annual	<b>11.87</b>	397.065	4833.765	46.94	<b>25</b>	<b>36.87</b>	<b>100</b>

#### E. Increment

The ISC-PRIME refined model was used to predict MMC's maximum Class II increment impacts in simple terrain. Because all pollutants in complex terrain were demonstrated to be below their respective significance levels for all averaging periods, intermediate and complex terrain increment modeling was not required.

MMC conservatively assumed that no credit was to be taken for any off-site sources existing in the 1987 and 1977 baseline years except for SO<sub>2</sub> from Fairchild Semiconductor. In addition, all other facilities were conservatively modeled at their maximum licensed allowed emission rates, with no credit allowed for current-actual emissions based on fuel use data.

Results of the single and combined source Class II increment analyses are shown in Tables III-7 and III-8, respectively. All modeled increment impacts were below all increment standards. Because all predicted increment impacts meet increment standards, no further Class II SO<sub>2</sub>, PM<sub>10</sub> and NO<sub>2</sub> increment modeling for MMC needed to be performed.

**TABLE III-7 : Class II Increment Consumption – MMC Alone**

Pollutant	Averaging Period	Max Impact ( $\mu\text{g}/\text{m}^3$ )	Receptor UTM E (km)	Receptor UTM N (km)	Receptor Elevation (m)	Class II Increment ( $\mu\text{g}/\text{m}^3$ )
SO <sub>2</sub>	3-hour	<b>99.06</b>	396.945	4833.645	44.20	<b>512</b>
	24-hour	<b>53.19</b>	397.045	4833.765	46.94	<b>91</b>
	Annual	<b>0.57</b>	397.250	4834.750	12.19	<b>20</b>
PM <sub>10</sub>	24-hour	<b>5.44</b>	397.025	4833.805	42.67	<b>30</b>
	Annual	<b>0.16</b>	396.945	4833.645	44.20	<b>17</b>
NO <sub>2</sub>	Annual	<b>4.08</b>	397.065	4833.785	46.33	<b>25</b>

**TABLE III-8 : Class II Increment Consumption – Combined Source**

Pollutant	Averaging Period	Max Impact ( $\mu\text{g}/\text{m}^3$ )	Receptor UTM E (km)	Receptor UTM N (km)	Receptor Elevation (m)	Class II Increment ( $\mu\text{g}/\text{m}^3$ )
SO <sub>2</sub>	3-hour	<b>417.58</b>	394.000	4846.000	152.40	<b>512</b>
	24-hour	<b>85.34</b>	409.000	4843.000	48.77	<b>91</b>
	Annual	<b>6.65</b>	399.20	4835.800	42.67	<b>20</b>
PM <sub>10</sub>	24-hour	<b>27.26</b>	395.300	4839.700	36.58	<b>30</b>
	Annual	<b>5.07</b>	394.913	4839.635	18.29	<b>17</b>
NO <sub>2</sub>	Annual	<b>11.87</b>	397.065	4833.765	46.94	<b>25</b>

Federal guidance and Chapter 140 of the DEP regulations require that any major source undergoing a major modification provide additional analyses of impacts that would occur as a direct result of the general, commercial, residential, industrial and mobile-source growth associated with the construction and operation of that source. Since this licensing action represents a minor modification to an existing minor source, no additional analyses were required.

**F. Class I Impacts**

Since the current licensing action for MMC represents a minor modification to a minor source and the nearest Class I area is approximately 98 kilometers away, MEDEP has determined that an assessment of Class I Air Quality Related Values (AQRVs) is not required.

**G. Summary**

In summary, it has been demonstrated that MMC in its proposed configuration will not cause or contribute to a violation of any SO<sub>2</sub>, PM<sub>10</sub>, NO<sub>2</sub> or CO averaging period MAAQS or any SO<sub>2</sub>, PM<sub>10</sub> or NO<sub>2</sub> averaging period Class II increment standards.

**ORDER**

Based on the above Findings and subject to conditions listed below the Department concludes that the emissions from this source:

will receive Best Practical Treatment,  
will not violate applicable emission standards,  
will not violate applicable ambient air quality standards in  
conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-431-71-H-A, subject to the conditions in license A-431-71-G-M/R in addition to the following conditions:

The following shall replace Condition 16 of Air Emission License A-431-71-G-M/R:

(16) Boiler Emissions

- A. Prior to the decommissioning of Boiler #1, #2, #3 and #4, fuel use in Boiler #1, #2, #3, #4, CUP Boiler #1, CUP Boiler #2 and CUP Boiler #3, combined, shall not exceed 2,000,000 gallons/yr of fuel oil with a sulfur content not to exceed 0.35% by weight, **or** 290,000,000scf of natural gas, **or** 290,000 MMBtu/yr in combination of the two. Fuel use records and receipts (showing the quantity of natural gas and/or fuel oil and percent sulfur of the fuel oil) for the boilers shall be maintained to demonstrate compliance. [MEDEP Chapter 115, BPT/BACT]
- B. After Boiler #1, #2, #3 and #4 have been decommissioned, fuel use in CUP Boiler #1, CUP Boiler #2 and CUP Boiler #3, combined, shall not exceed 3,214,286 gallons/yr of fuel oil with a sulfur content not to exceed 0.35% by weight, **or** 450,000,000 scf of natural gas, **or** 450,000 MMBtu/yr in combination of the two. Fuel use records and receipts (showing the quantity of natural gas and/or fuel oil and percent sulfur of the fuel oil) for the boilers shall be maintained to demonstrate compliance. [MEDEP Chapter 115, BPT/BACT]
- C. Combined emissions from Boilers #1, #2, #3 and #4 shall not exceed the following [MEDEP Chapter 115, BPT]:

Pollutant	lb/hour
PM	21.98
PM <sub>10</sub>	21.98
SO <sub>2</sub>	44.35
NO <sub>x</sub>	55.08
CO	44.05
VOC	0.6

- D. PM emissions from Boilers #1, #2 and #3 shall not exceed 0.20 lb/MMBtu each, when firing fuel oil. PM emissions from Boiler #4 shall not exceed 0.12 lb/MMBtu when firing fuel oil. PM emissions from all boilers when firing natural gas shall not exceed 0.10 lb/MMBtu. [MEDEP Chapter 115, BPT]
- E. MMC shall not exceed a combined heating input value of 110.1 MMBtu/hr at any given time for Boilers #1, #2, #3 and #4. Therefore the heat input for Boiler #1, #2, #3 and #4 must be recorded every hour in accordance with condition (8) of air emission license A-431-71-G-M/R. [MEDEP Chapter 115, BPT]

- F. When firing #2 fuel oil, emissions from CUP Boiler #1, CUP Boiler #2 and CUP Boiler #3, each shall not exceed the following [MEDEP Chapter 115, BACT]:

<u>Pollutant</u>	<u>lb/MMBtu</u>	<u>lb/hr</u>
PM	0.024	1.10
PM <sub>10</sub>	n/a	1.10
SO <sub>2</sub>	n/a	16.22
NO <sub>x</sub>	0.19	8.74
CO	n/a	3.22
VOC	n/a	1.38

- G. When firing natural gas, emissions from CUP Boiler #1, CUP Boiler #2 and CUP Boiler #3, each shall not exceed the following [MEDEP Chapter 115, BACT]:

<u>Pollutant</u>	<u>lb/MMBtu</u>	<u>lb/hr</u>
PM	0.01	0.46
PM <sub>10</sub>	n/a	0.46
SO <sub>2</sub>	n/a	0.05
NO <sub>x</sub>	n/a	1.61
CO	n/a	1.70
VOC	n/a	0.92

- H. Visible emissions

1. When firing #2 fuel oil, visible emissions from Boilers #1, #2, #3 and #4 shall not exceed 20% opacity on a 6 minute block average, except for no more than one six-minute block average in a 3 hour period. [MEDEP Chapter 101, BPT]
2. When firing natural gas, visible emissions from Boilers #1, #2, #3 and #4 shall not exceed 10% opacity on a 6-minute block average basis, except for no more than one six-minute average in a 3-hour period. [MEDEP Chapter 101, BPT]
3. When firing #2 fuel oil, visible emissions from the common stack serving CUP Boiler #1, #2 & #3 (Stack 1) shall not exceed 20% opacity recorded as six (6) minute block averages, except for no more than three (3) six (6) minute block averages in a 3-hour period. [MEDEP Chapter 115, BACT]

4. When firing #2 fuel oil, visible emissions from Boiler #4 and from CUP Boilers #1, #2 and #3 shall not exceed 20% opacity recorded as six-minute block averages, except for one six-minute period per hour of no more than 27% opacity. [40 CFR Part 60, Subpart Dc]
5. When firing natural gas, visible emissions from the common stack serving CUP Boiler #1, #2 & #3 (Stack 1) shall not exceed 10% opacity recorded as six (6) minute block averages, except for no more than three (3) six-minute block averages in a 3-hour period. [MEDEP Chapter 115, BACT]
6. When firing natural gas, visible emissions from each boiler shall not exceed 10% opacity recorded as six (6) minute block averages, except for no more than one six-minute block average in a 3-hour period. [MEDEP Chapter 101]
7. Compliance with the opacity limits identified in this section shall be determined using EPA Reference Method 9 as outlined in 40 CFR Part 60. MMC shall determine compliance with the opacity limits upon request of the Department. [MEDEP Chapter 115, BPT]

**The following shall replace Condition 17 of Air Emission License A-431-71-G-M/R:**

(17) Generator Emissions

- A. MMC shall limit the operation of the generators to 500 hours/year each, firing diesel fuel with a maximum sulfur content not to exceed 0.05% by weight. Fuel use records and receipts (showing the quantity of diesel fuel and percent sulfur of the fuel) for the diesel units shall be maintained to demonstrate compliance. Compliance with the hour limit will be determined by a log or an hour meter. [MEDEP Chapter 115, BPT/BACT]
- B. Emissions from the Boiler Room Generator shall be limited to the following [MEDEP Chapter 115, BPT]:

<u>Pollutant</u>	<u>lb/hr</u>
PM	0.58
PM <sub>10</sub>	0.58
SO <sub>2</sub>	0.15
NO <sub>x</sub>	12.8
CO	2.8
VOC	1.0



- C. Emissions from the Fire Pump Generator shall be limited to the following [MEDEP Chapter 115, BPT]:

<u>Pollutant</u>	<u>lb/hr</u>
PM	0.26
PM <sub>10</sub>	0.26
SO <sub>2</sub>	0.07
NO <sub>x</sub>	5.7
CO	1.2
VOC	0.46

- D. Emissions from the Computer Room Generator shall be limited to the following [MEDEP Chapter 115, BPT]:

<u>Pollutant</u>	<u>lb/hr</u>
PM	0.29
PM <sub>10</sub>	0.29
SO <sub>2</sub>	0.12
NO <sub>x</sub>	10.6
CO	2.3
VOC	0.84

- E. Emissions from the LL Bean Wing # 1 and # 2 Generators each shall be limited to the following [MEDEP Chapter 103 and Chapter 115, BPT]:

<u>Pollutant</u>	<u>lb/MMBtu</u>	<u>lb/hr</u>
PM	0.12	0.54
PM <sub>10</sub>	n/a	0.54
SO <sub>2</sub>	n/a	0.23
NO <sub>x</sub>	n/a	15.7
CO	n/a	3.7
VOC	n/a	0.45

- F. Emissions from the NDF # 1 and # 2 generators each shall be limited to the following [MEDEP Chapter 103 and Chapter 115, BPT]:

<u>Pollutant</u>	<u>lb/MMBtu</u>	<u>lb/hr</u>
PM	0.20	0.88
PM <sub>10</sub>	n/a	0.88
SO <sub>2</sub>	n/a	0.22
NO <sub>x</sub>	n/a	15.4
CO	n/a	3.6
VOC	n/a	0.44

- G. Emissions from Generator # 7 shall be limited to the following [MEDEP Chapter 103 and Chapter 115, BPT]:

<u>Pollutant</u>	<u>lb/MMBtu</u>	<u>lb/hr</u>
PM	0.12	1.5
PM <sub>10</sub>	n/a	1.5
SO <sub>2</sub>	n/a	0.62
NO <sub>x</sub>	n/a	51.4
CO	n/a	9.8
VOC	n/a	1.2

- H. Emissions from the CUP Generator shall be limited to the following [MEDEP Chapter 115, BACT]:

<u>Pollutant</u>	<u>lb/MMBtu</u>	<u>lb/hr</u>
PM	0.06	1.16
PM <sub>10</sub>	n/a	1.16
SO <sub>2</sub>	n/a	1.07
NO <sub>x</sub>	n/a	41.83
CO	n/a	4.51
VOC	n/a	2.1

- I. Visible Emissions

1. Visible emissions from the Boiler Room Generator, LL Bean Wing Generator #1, LL Bean Wing Generator #2, Fire Pump Generator, Generator NDF # 1, Generator NDF # 2, Computer Room Generator and Generator #7 each shall not exceed 30% opacity on a six (6) minute block average basis, except for two (2) six (6) minute block averages in a 3-hour period. [MEDEP Chapter 101]

2. Visible emissions from the CUP Generator shall not exceed 20% opacity on a six (6) minute block average basis, except for two (2) six (6) minute block averages in a 3-hour period. [MEDEP Chapter 101]
3. Compliance with the opacity limits identified in this section shall be determined using EPA Reference Method 9 as outlined in 40 CFR Part 60. MMC shall determine compliance with the opacity limits upon request of the Department. [MEDEP Chapter 115, BPT]

**The following shall replace Condition 18 of Air Emission License A-431-71-G-M/R:**

- (18) New Source Performance Standards [40 CFR Part 60, Subpart Dc]

For CUP Boilers #1, #2 and #3, and for Boiler #4 until its decommissioning, MMC shall comply with the requirements of Federal New Source Performance Standards (NSPS) 40 CFR Part 60, Subpart Dc and shall comply with the notification and record keeping requirements of 40 CFR Part 60.48c.

In accordance with 40 CFR Part 60.8, 60.43c(c), and 60.45c(a)(8), MMC shall perform an initial Method 9 test to determine the opacity of stack emissions from CUP Boilers #1, #2 and #3. The initial test shall be performed within 60 days after achieving the maximum production rate on oil, but not later than 180 days after initial startup of the facility on oil.

MMC is required to send a semi-annual report to the EPA. If fuel oil is burned in any of the Subpart Dc boilers (i.e., Boiler #4 and CUP Boilers #1, #2 and #3), the report must contain a summary of the fuel oil use and fuel supplier certification covering the 6-month reporting period. If no fuel oil is burned in any of the Subpart Dc boilers for a given reporting period, the report must simply state that no fuel oil was fired during the reporting period. All reports must be postmarked by the 30<sup>th</sup> day following the end of the reporting period. The address is:

US EPA Region I  
Attn: Air Compliance Clerk  
One Congress Street  
Suite 1100 (MC SEA)  
Boston, MA 02114-2023

Maine Medical Center  
Cumberland County  
Portland, Maine  
A-431-71-H-A

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**Departmental  
Findings of Fact and Order  
Air Emission License  
Amendment #1**

**The following is a new condition:**

**(21) Payment of Fees**

MMC shall pay the annual air emission license fee within 30 days of **August 30th** of each year. Pursuant to 38 MRSA §353-A, failure to pay this annual fee in the stated timeframe is sufficient grounds for revocation of the license under 38 MRSA §341-D, subsection 3. [38 MRSA §353-A]

DONE AND DATED IN AUGUSTA, MAINE THIS                      DAY OF                      2004.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: \_\_\_\_\_  
DAWN R. GALLAGHER, COMMISSIONER

**The term of this amendment shall be concurrent with the term of Air Emission License A-431-71-G-M/R.**

PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: May 5, 2004

Date of application acceptance: May 17, 2004

Date filed with the Board of Environmental Protection \_\_\_\_\_

This order prepared by Mark E. Roberts, Bureau of Air Quality